

Q2Q3D Specifications, Requirements and Scope

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Q2Q3D Outline

- Q2Q3 and Dipole Contracts
- Q2Q3 and Dipole Specifications
- Scope of Work JLAB
- Scope of Work SigmaPhi
- Contract Reviews
- Contract Documentation

SHMS 11 GeV/c Spectrometer Hall C- June 2016

New companion to the 25 Year old HMS 7.4 GeV/c spectrometer

- 11 GeV/c
- 5×10^{-4} dP/P resolution
- 4 mStr. Acceptance
- 5.5 to 40 degrees
- Momentum bite 20%



SHMS Spectrometer- June 2016

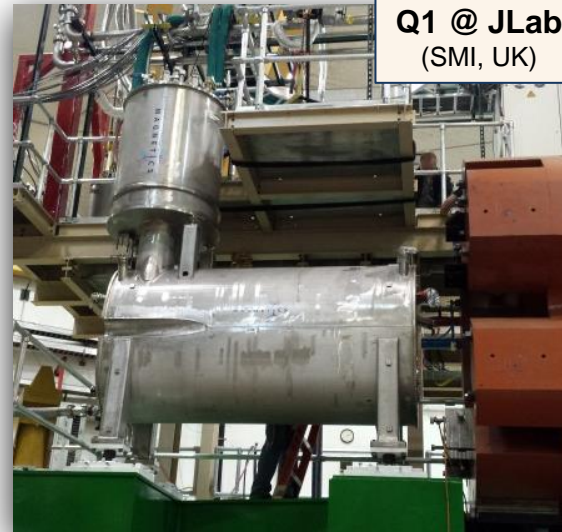
detectors and magnet yokes



Hall C SHMS Magnets a Year Ago – June 2015



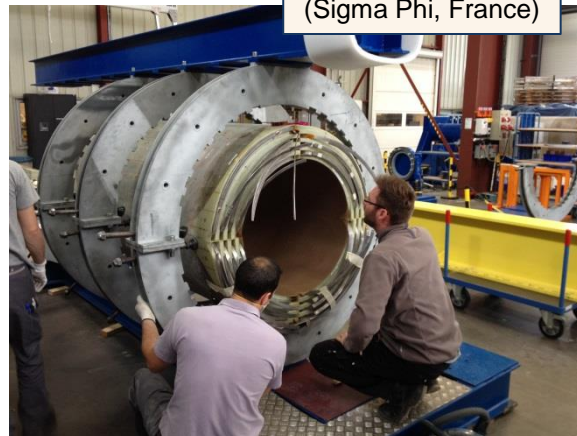
HB @ JLab
(MSU/FRIB)



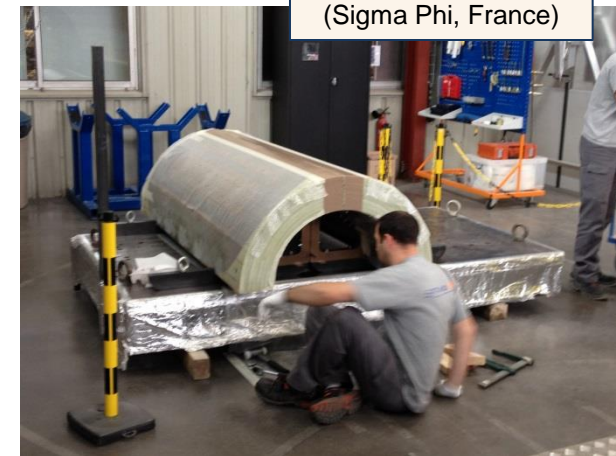
Q1 @ JLab
(SMI, UK)



Dipole Trial Collaring
(Sigma Phi, France)



Q2 splicing
(Sigma Phi, France)



Q3 coil assembly
(Sigma Phi, France)

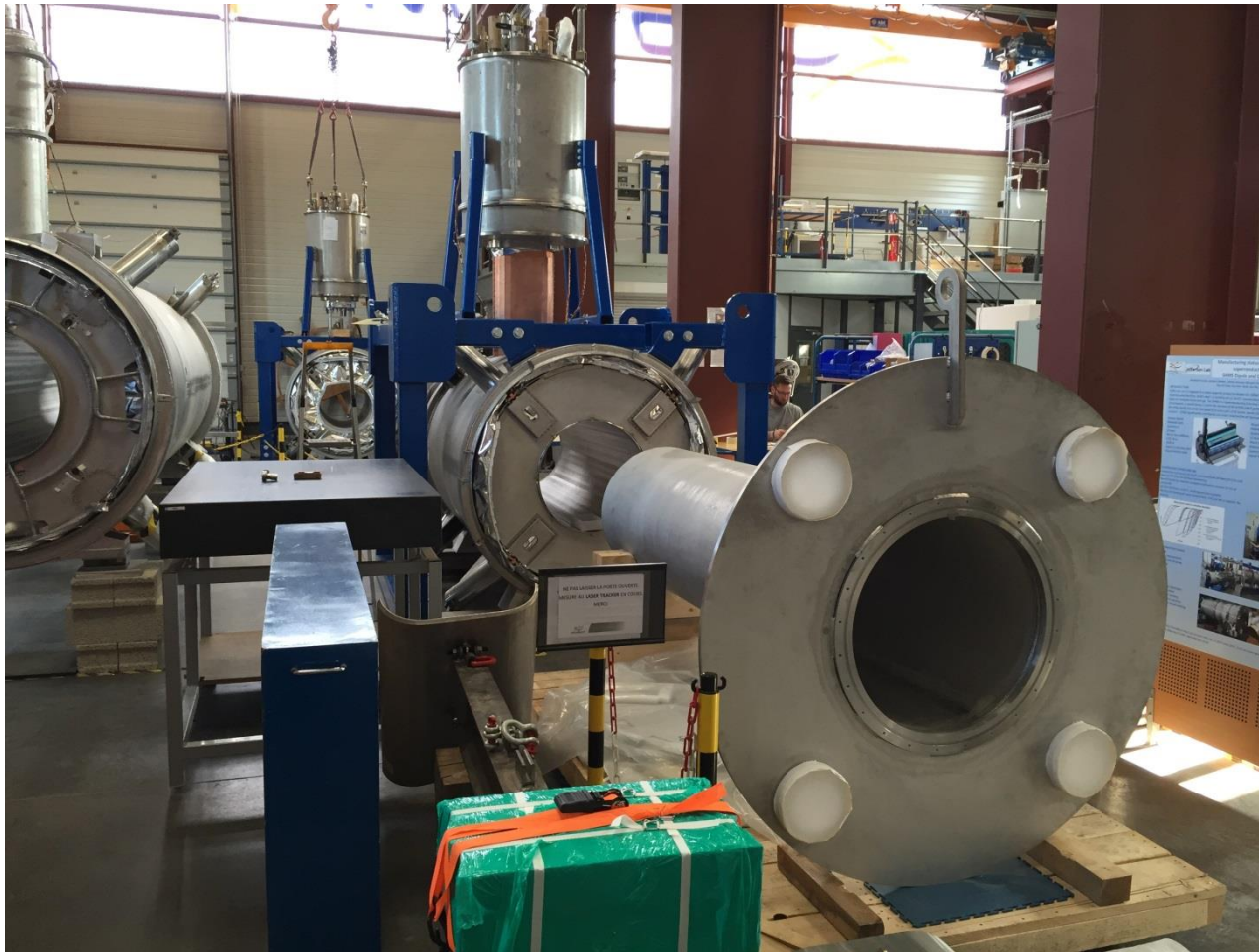
SHMS Q1 and HB Status



- **Q1:**
 - Installed on SHMS
 - Cooled down
 - Power test to 3000 Amps or 110% of operational current
 - Accepted 2015

- **HB:**
 - Installed on SHMS
 - Cooled down
 - Power test to 4000 Amps or 102% of operational current
 - Accepted 2016

Dipole , Q2 & Q3 April 2016



Q3 & Dipole June 2016



Q2 July & August 2016



Q2 at JLAB October 2016

Q2Q3 and Dipole Contracts

- Two Fixed price Design Build Contracts placed with SigmaPhi as a result of a competitive “Best Value” award process- world bidders list- Buy America Act
- Bid documents included a JLAB Reference Conceptual Design(RCD) for both magnets including CAD models, TOSCA models, FEA, models, drawings, reports, test results
- Dipole Contract awarded Aug 2010
- Q2Q3 Contract awarded Oct 2010

Q2Q3Dipole Contracts

- Q2Q3D were 4 year contracts now about 6 years
- Q2Q3D fixed price contracts ~ 20% delta
 - Extra scope items- consolidation and tests
 - Productivity investments- extra tooling and shifts
 - Storage of JLAB excess conductor and tooling
 - Negotiated costs for extra work and problems

Q2Q3Dipole Status

- Q2 is in JLAB Hall C installed on SHMS
- Dipole is on board a ship in Antwerp or ?????
- Q3 is complete, tested, packed and ready to ship from SigmaPhi Brittany, France
- Documentation
 - FDR Drawings, analysis, reports- Complete
 - Dipole manufacturing Doc. - 90 % complete
 - Q2Q3 manufacturing Doc.- 75 % complete

Dipole Specifications

Q2Q3 Specifications

Common Requirements

Scope of Work - JLAB

- RCD provided by JLAB
- Conductor
 - Superconductor(surplus SSC outer 32 strand cable)
 - Copper Stabilizer(copper channel extrusion - FreeportMcMoran)
 - Soldering(AES, Allentown PA)
- Cryo-Control Reservoir(CCR)- Meyer Tool & Mfg.
- DC Power Supply (DCPSU)- Danfysik
- Quench protection and Detection
- PLC controls, instrumentation read out, logging-JLAB
- Warm Yoke- Ningbao-Jensen & Craft Machine
- All on site installation and assembly except soldering dipole SC bus
- All on site services for Acceptance Testing (labor, cryogenics, AC power)
- Plus all the free advice the contractor can stand!

Scope of Work - SigmaPhi

- Q2Q3 and Dipole Design and Analysis thru manufacturing drawings
- Design & build all manufacturing tooling
- Design all manufacturing processes
- Design and perform all QA, QC, Inspections and Tests
- Host Preliminary, Intermediate and Final Design reviews
- Q2Q3D Documentation
- Attend and present at ERR review
- Integrate JLAB items (SC, CCR) into Q2Q3D
- Attend Magnet Arrival Tests and Acceptance tests

Scope of Work SigmaPhi II

- Manufacture Q2Q3D SC magnets
 - Consolidate conductor (contract mod)
 - Wind coils
 - Vacuum impregnate coils
 - Assemble coils into cold masses
 - Collar coils
 - Magnet instrumentation(Volt Taps, LHE&LN2 Temp. sensors, strain gauges)
 - Fabricate cryostats
 - Final magnet assembly
 - Pack and ship to JLAB Hall C

Summary

- Two fixed price contracts for Q2Q3 and Dipole have born fruit
- Magnet installation has begun for Q2
- Dipole is at sea and Q3 is ready to ship
- Q2 Cool Down begins in few weeks
- Q2 Power Testing begins in ~ 1 month